

Citation:

Crossman A, Anne Sullivan D, Benin M. The family environment and American adolescents' risk of obesity as young adults. Soc Sci Med. 2006 ;63(9):2255-67.

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Study Design:

Prospective cohort study

Class:

B - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To study the effects of the family environment and adolescents' behaviors while in school grades 7 through 12 on their weight status 6 years later are examined using data from the United States National Longitudinal Study of Adolescent Health.

Inclusion Criteria:

- Public and private high schools and middle schools adolescents grades 7 through 12.
- School administrators and adolescents' parents.
- 18 and 26 years of age.
- For this study, only in-home interview respondents who participated in the first and third waves

Exclusion Criteria:

- Respondents with an underweight BMI of less than 18.5 are also omitted because of the association between serious illness and low weight.

Description of Study Protocol:**Recruitment**

- The study includes a sample of 80 public and private high schools and 52 middle schools that are representative of all regions of the United States, urban/rural location, school size, school type, and ethnicity.
- Approximately 90,000 adolescents completed questionnaires from which a smaller sample was selected for in-home interviews.

Design

- Trend study

Blinding used (if applicable)

NA

Intervention (if applicable)

NA

Statistical Analysis

- Ordinal regression models of weight status in young adulthood are tested separately for males and females.
- Responder analysis was conducted.
- Analytic weights adjust for the complex sample design and SUDAAN is used in the final analyses to adjust the standard errors for the complex multilevel sampling design.
- All variables except the dependent are measured at Wave I.
- Predictor variables were screened to avoid multicollinearity.
- Four models:
 - 1) includes only the adolescents' ascribed and family characteristics
 - 2) adds perceptions of family relationships
 - 3) adds self-esteem and weight status
 - 4) adds proximate adolescent behaviors associated with weight

Data Collection Summary:

Timing of Measurements

- Home interviews were conducted in 1995 during Wave I.
- Wave III was conducted 6 years later between August 2001 and April 2002.

Dependent Variables

- Body weight at Wave III

Independent Variables

Family characteristics: parents' obesity; adolescent's demographics

Family relationship: parental control of diet, TV time; minimum closeness between adolescent and parents; perception that parents care

Adolescent weight and self-esteem at Wave I

Adolescent behavior: number of physical activities, hours of television watched and video games played per week, skips breakfast

Control Variables

Age, body weight and family environment

Description of Actual Data Sample:

Initial N: 90,000 adolescents; for this analysis, potential N=10,828

Attrition (final N):

- The 6378 respondents (3193 who are normal weight, 1812 who are overweight, and 1373 are obese at Wave III).

Age:

- Between 18 and 26 years of age

Ethnicity:

- White
- Hispanic
- Black/African American
- Native American
- Asian
- Other

Other relevant demographics:

- Family characteristics, family structure, income, education level, age, family relationship, Adolescent weight and self-esteem at Wave I, adolescent behaviors

Anthropometrics Weight, BMI

Location: USA

Summary of Results:

- Having an obese mother or father increases the probability of being overweight or obese in young adulthood by a factor of approximately one and a half.
- Higher parental socioeconomic status, measured by education and household income, decreases it. Blacks and Native Americans have significantly higher odds of excessive weight in young adulthood, while Whites and Asians have lower odds.
- At the extremes, Native Americans are 14% more likely to be in a higher weight category as young adults, while Asians are 41% less likely.
- Parental control of diet, adolescents' age, self-esteem, and each of the included adolescent behaviors are also significant predictors of excessive weight in young adulthood.
- Parental education continues to have a significant inverse effect on females' weight status in young adulthood.
- Male and female adolescents respond to different dimensions of family relationships in ways that have long term effects on their body weight.
- Model 3 adds adolescent self-esteem and weight status to family environment.
- Adolescent self-esteem is a much less powerful predictor of young adult weight and it is significant among females.
- Family environment such as parents educational level, mother or father' obesity, being Black or Native American, parental control of diet, closeness to parents and perception that parents care continue to have long term effects on weight status in young adult hood independent of weight status in adolescence, however, these effects differ by gender.
- All predictors of female young adult weight in model 2 remain significant in model 3, along with adolescent weight and self-esteem. Females with low self-esteem are at higher risk for excessive weight in young adulthood, irrespective of their adolescent weight status and family environment.
- Skipping breakfast predicts male weight in young adulthood in the presence of the family environment variables and adolescent weight status but it is not significant for females.
- The small improvement in predicting female weight in young adulthood in model 4 comes from the amount of time they spent as adolescents in passive activities such as watching television, videos and playing video games.
- Ordinal regression models of 6378 adolescents reveal that their family environments exert an influence on their weight that lasts into young adulthood.
- Parental obesity puts both males and females at greater risk for being overweight or obese as young adults, as does already having excessive weight in adolescence.
- The findings also reveal significant gender differences in the intergenerational transmission of body weight within families.
- Higher parental educational attainment, a stronger perception that parents care about them, and a higher self-esteem reduce female adolescents' risk for excessive weight as young adults, while being African American or Native American increases it.
- In contrast, only a perception that their parents are trying to control their diets and a higher degree of closeness with a parent put male adolescents at greater risk for excessive weight as young adults.
- Adolescents' participation in physical activities does not predict subsequent weight for either males or females, although the amount of time spent in sedentary activities does for females, but not males.

- The only adolescent behavior examined that influenced male weight in young adulthood was eating breakfast.

Author Conclusion:

- The research suggests that prevention must begin at home to break the transmission of obesogenic values and norms from one generation to the next.
- A public health campaign that educates all adults with children in the home on the importance of creating a family environment that promotes healthy habits.
- This campaign needs to stress the serious long-term health implications of excessive weight accumulated in childhood and adolescence and the important role parents have in prevention.
- The campaign needs to target homes with children younger than adolescents as well as those with only adolescents because the family environment impacts young adults' weight status both directly and indirectly through earlier influence on their weight status as adolescents which in turn is a major predictor of weight status as young adults.
- Parents and other caretakers should be urged to exert control over children's diets, including making a healthy breakfast a priority, and to limit the amount of free time that children spend on sedentary activities.
- Finally, parents who are overweight or obese need to understand that they are not only putting themselves at risk for serious health problems, they are also putting their children at risk.

Reviewer Comments:

- *This is a longitudinal and retrospective study suggests that prevention is better way for public health and family environment should be created to promote healthy habits among family members.*
- *This is a representative sample and well designed with enough sample size to conclude the findings.*
- *Further controlled studies are required to study the change in family environment and healthy habits including dietary habits and intakes on overweight/obesity.*

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	Yes
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	Yes

Validity Questions

1.	Was the research question clearly stated?	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	Was the selection of study subjects/patients free from bias?	Yes

2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	Yes
3.	Were study groups comparable?	Yes
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	Yes
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	Was method of handling withdrawals described?	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	Was blinding used to prevent introduction of bias?	No

5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	N/A
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	No
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were intervening factors described?	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	Yes
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	Were outcomes clearly defined and the measurements valid and reliable?	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	Yes

7.7.	Were the measurements conducted consistently across groups?	N/A
8.	Was the statistical analysis appropriate for the study design and type of outcome indicators?	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	Yes
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	Yes
9.	Are conclusions supported by results with biases and limitations taken into consideration?	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	Is bias due to study's funding or sponsorship unlikely?	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes

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